

Study the production of identified hadrons in Au+Au collisions at $\sqrt{s_{NN}} = 54.4$ GeV using the STAR detector

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Exploring the QCD phase diagram and searching for the QCD critical point are some of the main goals of Beam Energy Scan (BES-I) program at RHIC. In 2017, as a continuation to BES-I, the STAR experiment collected large datasets of Au+Au collisions at $\sqrt{s_{NN}} = 54.4$ GeV. The identified particle spectra and yields provide information about the bulk properties of the medium. The centrality dependence of the freeze-out parameters provides an opportunity to enlarge the (T, μ_B) region of the phase diagram to search for the QCD critical point.

We present the measurements of identified charged particle spectra of π^\pm , K^\pm , p, and \bar{p} at midrapidity $|y| \leq 0.1$. The results for the transverse momentum spectra, particle yields dN/dy , average transverse momentum $\langle p_T \rangle$, and particle ratios will be presented for different centrality classes and compared with AMPT and HIJING model calculations. In addition, the extracted freeze-out parameters will be compared with the previously published results. The physics implications of the results will be discussed.